



# Welcome to NSF Day!

**Maryland Science Center** December 8, 2014

### **What NSF Does**

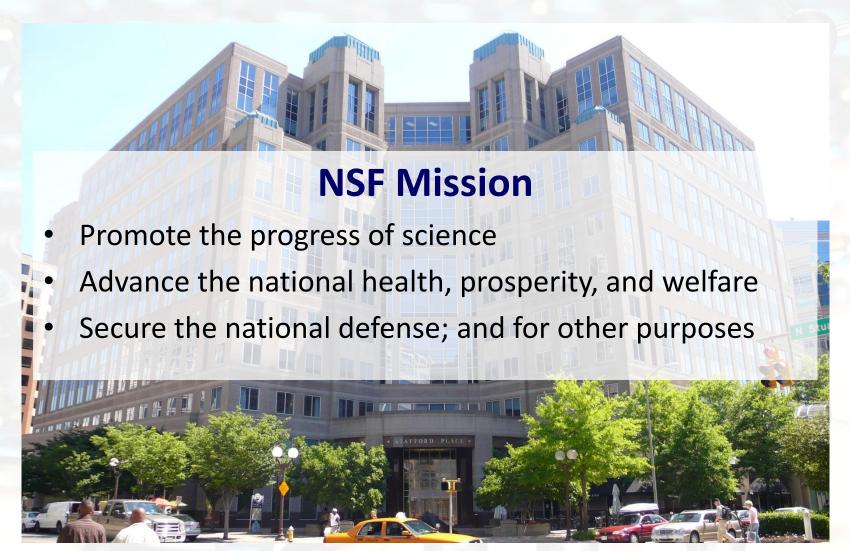
### **NSF Vision**

- Advance discovery, innovation, and education beyond the frontiers of current knowledge
- Empower future generations in science and engineering





### **What NSF Does**









### **NSF Core Values**

Scientific Excellence **Organizational Excellence** Learning **Inclusiveness Accountability for Public Benefit** 



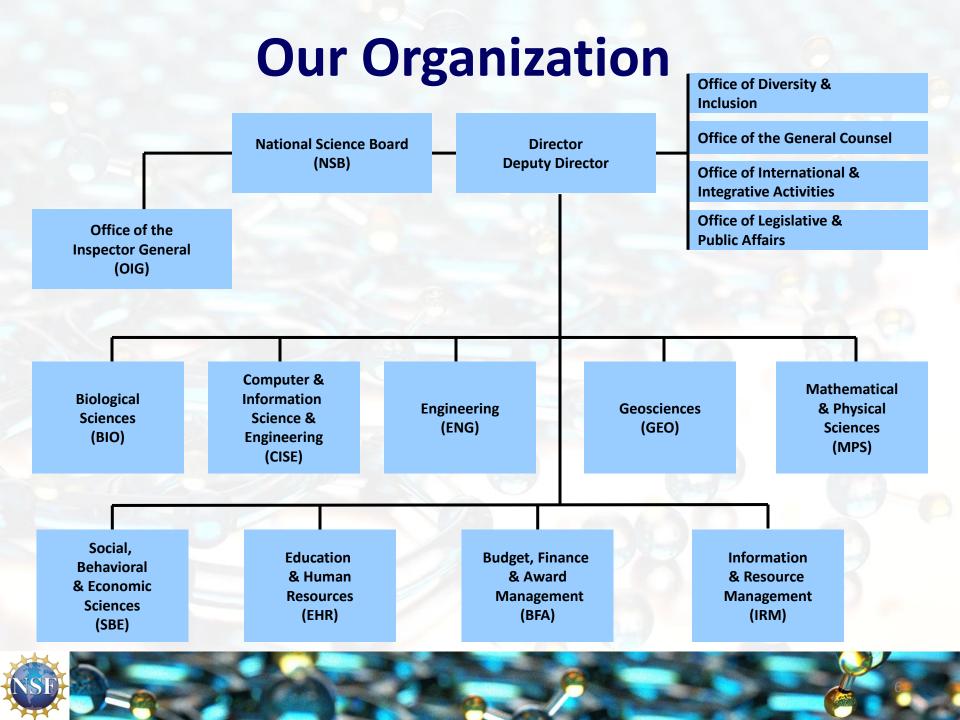
### The NSF in a Nutshell

- Independent agency
- Co-lead by a Director and National Science Board
- Supports basic research & education
- Uses grant mechanism through competitive merit review

- Discipline-based structure
- Cross-disciplinary mechanisms
- Use of Rotators/IPAs
- Low overhead (~6%)
- Highly automated







## **NSF By The Numbers**

1922	Colleges, universities, and other institutions NSF funded	
10,800	Competitive awards NSF funded	
47,800	Students supported by NSF Graduate Research Fellowships (since 1952)	
50,000	Proposals evaluated through competitive merit review	
233,000	(Total) Reviews conducted	
299,000	Individuals NSF directly supported (researchers, postdocs, trainees, teachers, and students)	
\$6.9 billion	FY 2013 Budget Actuals	
\$7.2 billion	FY 2014 Budget Actuals	
Figures represent FY 13 actuals		





## NSF Budget: FY 2014 and FY 2015

(dollars in millions)

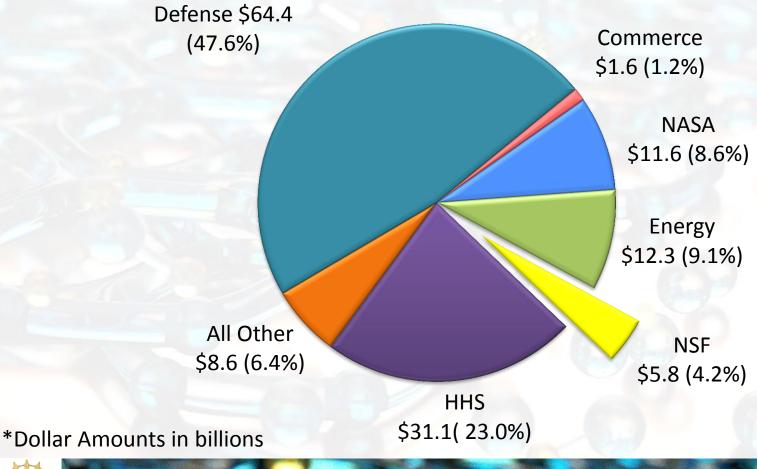
(dollars ill lillillolis)		11/1/1
	FY 2014	FY 2015
	Plan	Request
Research & Related Activities (R&RA)	\$5,802	\$5,807
Education & Human Resources	845	890
Major Research Equipment & Facilities Construction	200	201
Agency Operations & Award Management (AOAM)	306	338
National Science Board	4	4
Office of Inspector General	14	14
Total, NSF	\$7,172	\$ <mark>7,2</mark> 55
Opportunity, Growth, and Security Initiative	Despite	552





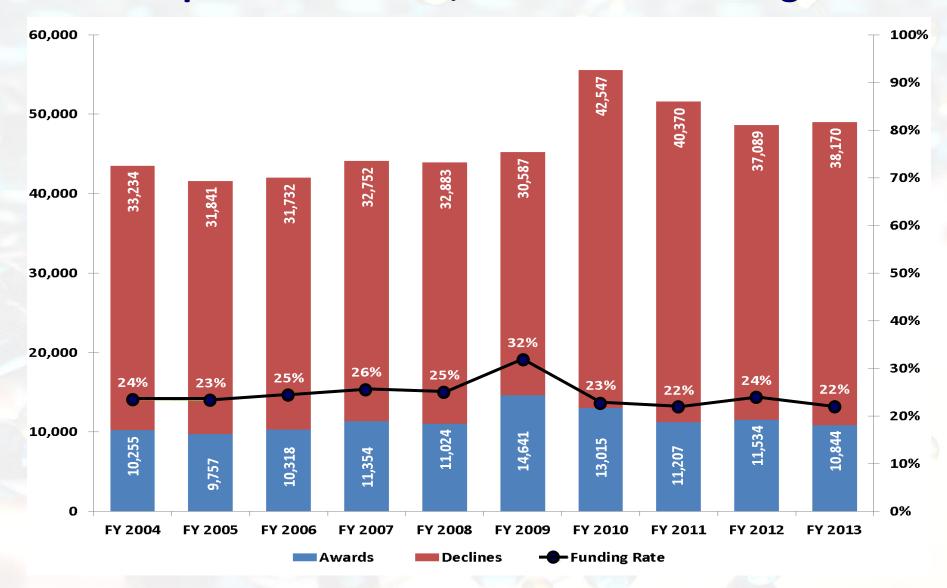
## **NSF In Perspective**

2015 Total Federal R&D Budget for the United States (\$135.4 Billion)





### **NSF Competitive Awards, Declines & Funding Rates**









## NSF is Committed to Transparency and Accountability

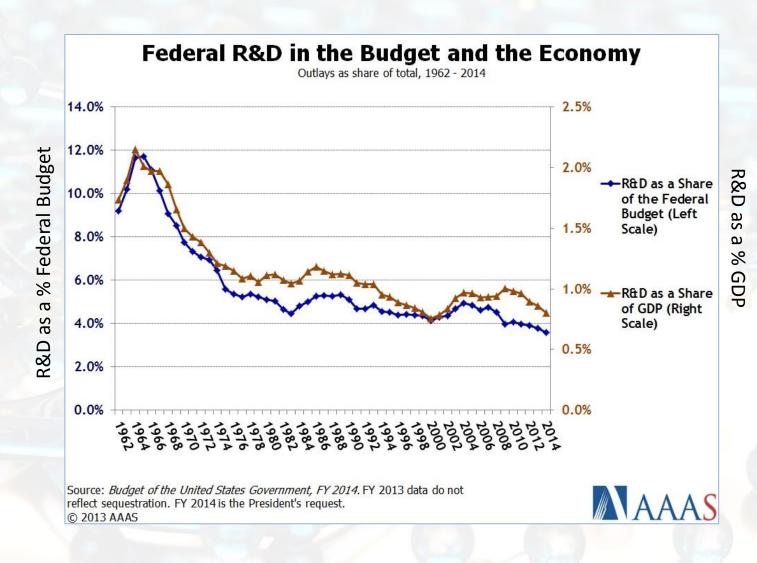
Projects and the expenditure of public funds must be clearly described and justified.







## The Changing Budget Landscape







## **Public Scrutiny of the NSF**

Congressional debate over science funding draws fire from critics

Senate Moves to Limit NSF Spending on Political Science

#### Why is Our Government Attacking Science?

Rampant Waste Reported in NSF

Amendment Limiting
National Science Foundation
Research Funding Passes Senate

The Congressional War on the Social Sciences

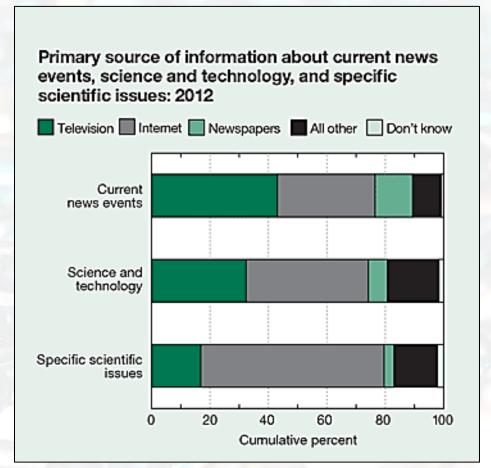
Coalition of Scientific Organizations Defend NSF Peer Review

Many Rival Nations Surge Past the U.S. in Adding New Jobs





## The Media Landscape



Source: Science & Engineering Indicators 2014





## **Society's Changing Needs**

















## **NSF's Communication Strategy**

Create a Context and Narrative for the General Public and for **Policy Makers** 



Climate Scientist Michael Mann Interview, Part 1

"New McCarthyism" targets climate scientists, say Mann.

09:28 | 07/07/2012



If you read the news lately about North Dakota, you may get the impression that we're some sort of economic wunderkind. The reason is that in comparison with the rest of the U.S., North Dakota has an extremely low unemployment rate: Just 3.2 percent. That's the lowest in the nation, by a considerable margin. And much of it is thanks to an unfolding unconventional oil and gas boom here, which has generated a large number of

and keeping its citizens employed—at least in "old economy" industries like agriculture and fossil energy, But if you look forward to the future, we're not necessarily so well positioned. According to the Washington, D.C. based Information Technology and Innovation Foundation, we rank 34<sup>th</sup> overall in the strength of our new economy sector. The economics of the 21st century will demand a much more tech savvy and advanced workforce, and plentiful jobs in hi tech industries-and what's more, oil booms by nature are cyclical, and there are reasons to think the current one will someday end. If we're going to continue to compete, those jobs need

(Experimental Program to Stimulate Competitive Research) is doing its part by helping to spur innovation in sectors that you don't usually associate with a big oil state—fields such as clean energy, sustainable materials, and green chemistry. Right now, the program is nearing the completion of a 5 year, \$ 15 million grant tha has focused on two areas in particular: Generating clean and renewable energy directly from the crops that grow so plentifully here in the Great Plains, and creating sustainable materials—including those produced through innovative "green chemistry" approaches, which use less water and leave less of an environmental mark. Looking forward, we're also pursuing a new grant to focus further on sustainable materials research, and no wonder. Already, this body of science is paying off significantly in terms of economic benefits for

Take our "SUNRISE" program-Sustainable Energy Research, Infrastructure, and Supporting Education -which is focused on converting oils from crops into fuels and chemicals, rather than relying on carbon ntensive fossil sources. Over the course of our work here. 11 patents have been issued under this program







Meet Our Team

#### Recent Posts

Generation Innovation Priming the Science Education Pipeline in Alaska From Oil Boom to Science

Boom: Fueling North Dakota's Hi-Tech Economy

#### **Twitter Updates**





### When Should You Communicate?

**Before**, **during** and **after** your work is NSF funded, work with:

- Your NSF program officer
- Your institution's public information officer
- Broader communities
- NSF Office of Legislative and Public Affairs









### Failure to Communicate





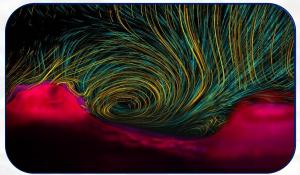


## The NSF Directorates and Offices

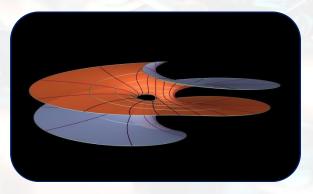




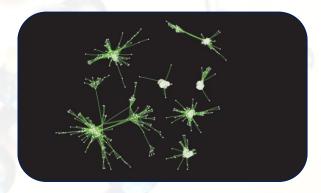














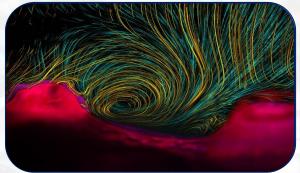


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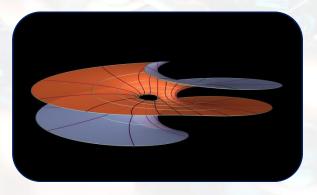




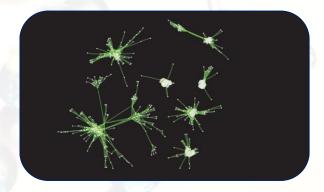
















## **Biological Sciences (BIO)**



#### Sam Scheiner

Division of Environmental Biology <a href="mailto:sscheine@nsf.gov">sscheine@nsf.gov</a>

- Runs programs in evolutionary processes and the ecology & evolution of infectious disease.
- Theoretical biologist working in evolution, ecology, and general biology.
- Former associate professorships at Arizona State University West and Northern Illinois University.
- Adjunct faculty at the University of Arizona.





### **Biological Sciences (BIO)**

James Olds, Assistant Director
Jane Silverthorne, Deputy Assistant Director

Emerging Frontiers (EF)

Division of Biological Infrastructure (DBI)

Scott Edwards, Division Director

James Deshler, Deputy Division Director

Division of Molecular and Cellular Biosciences (MCB)

**Gregory Warr**, Division Director **Theresa Good**, Deputy Division Director

Division of Environmental Biology (DEB)

Penny Firth, Division Director

Alan Tessier, Deputy Division Director

Division of Integrative Organismal Systems (IOS)

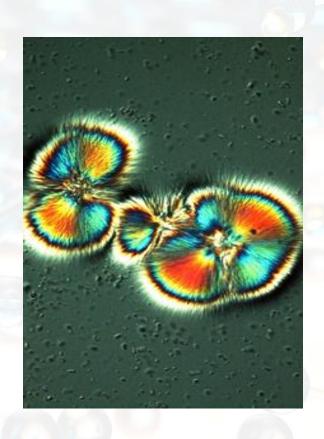
William Zamer, Division Director
Michelle Elekonich, Deputy Division Director



## **Biological Sciences (BIO)**

### **Priorities**

- Brain Research through Advancing Innovative Neurotechnologies (BRAIN)
- National Ecological
   Observatory Network
   (NEON)
- Dimensions of Biodiversity



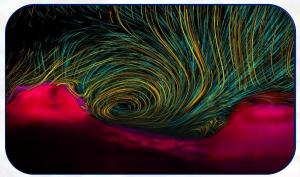


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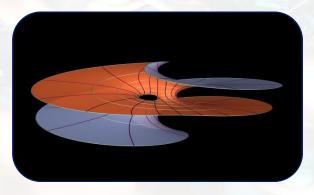




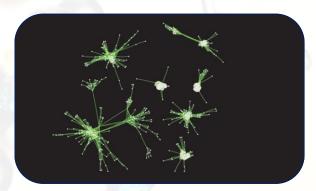
















## **Computer & Information** Science & Engineering (CISE)



#### **Jeremy Epstein**

Computer and Network Systems jepstein@nsf.gov

- Lead program officer for Secure and Trustworthy Cyberspace (SaTC)
- On loan from SRI International (focus areas: voting systems security and software security).
- Associate editor in chief, IEEE Security & Privacy
- Vice chair, ACM USACM Public Policy Committee
- Founder, ACSA Scholarship for Women Studying Information Security.





# Computer & Information Science & Engineering (CISE)

Suzanne C. Iacono, (Acting) Assistant Director, Deputy Assistant Director

James F. Kurose, Assistant Director (As of Jan. 1, 2015) Erwin P. Gianchandani, (Acting) Deputy Assistant Director

Division of Advanced Cyberinfrastructure (ACI)

Irene M. Qualters, Division Director Mark Suskin, Deputy Division Director

Division of Information and Intelligent Systems (IIS)

Deborah F. Lockhart, (Acting) Division Director, Deputy Division Director Lynne Parker, Division Director (As of Jan, 1, 2015) Division of Computer and Network Systems (CNS)

**Keith Marzullo**, Division Director **Erwin P. Gianchandani**, Acting Deputy Division Director

Division of Computing and Communication Foundations (CCF)

**S, Rao Kosaraju**, Division Director **James J. Donlon**, Deputy Division Director





# Computer & Information Science & Engineering (CISE)

### **Directorate Priorities**

Core research programs across computer science

Cross-CS and cross-NSF programs (e.g., BRAIN,

SaTC, NRI)

 CS education (cyberlearning)

 Building cyber infrastructure





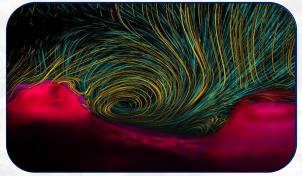


## The NSF Directorates and Offices

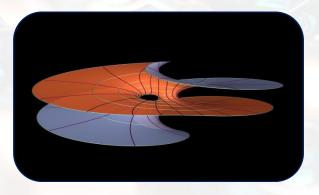




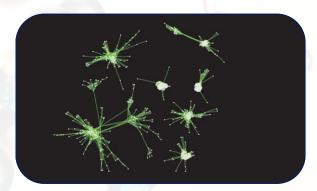
















### **Education & Human Resources (EHR)**



#### **Earnestine Psalmonds Easter**

Program Director <a href="mailto:eeaster@nsf.gov">eeaster@nsf.gov</a>

- Program director for EHR Workforce
   Development Core Research and HBCU
   Undergraduate Program
- Co-coordinator, Research Experience for Undergraduates (REU) program.
- Former co-study director for two National Academies reports, one on increasing minority representation in S&E





### **Education & Human Resources (EHR)**

Dr. Joan Ferrini-Mundy, Assistant Director

Division of Graduate Education (DGE)

Valerie Wilson, (Acting) Division Director

Division of Human Resource Development (HRD)

Sylvia M. James, Division Director

Division of Research on Learning in Formal and Informal Settings (DRL)

Sarah Kay McDonald, (Acting) Division Director

Division of Undergraduate Education (DUE)

Susan R. Singer, Division Director





## **Education & Human Resources (EHR)**

### **Learning and learning environments**

Understanding cognitive and non-cognitive foundations of STEM learning and the creative use of formal and informal STEM learning environments.

### **Broadening participation in STEM**

Understanding how to effectively ensure access to and success in high quality STEM education for underrepresented groups

### STEM professional workforce development

Educating and preparing a STEM workforce ready to capitalize on scientific advances and address global, social, and economic challenges yet to be imagined















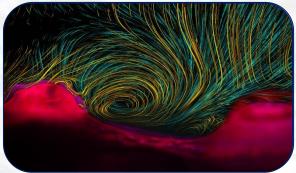


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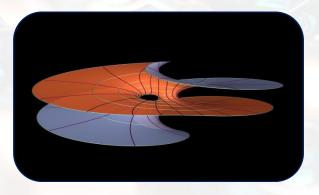




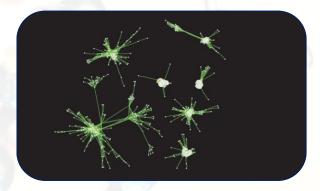
















## **Engineering (ENG)**



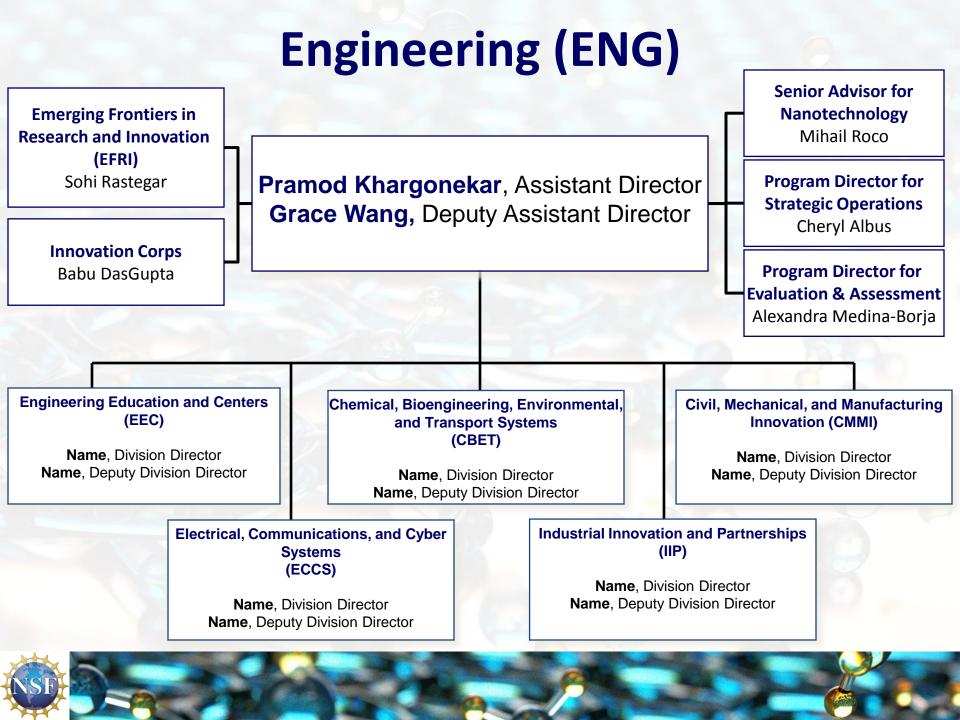
#### **Lawrence Bank**

ENG/CMMI lbank@nsf.gov

- Lead program director for the NSF solicitation focused on the science of sustainable buildings.
- Rotator from the City College of New York.
- Serves on journal editorial boards: Construction and Building Materials, Journal of Composites for Construction (which he founded) and Advances in Structural Engineering.
- Author of widely-used textbook "Composites for Construction: Structural Design with FRP Materials."







### **Engineering (ENG)**

### **NSF-wide major investments**

- Advanced Manufacturing
- Clean Energy
- National Nanotechnology Initiative
- National Robotics Initiative
- Innovation Corps (I-Corps)
- Brain Research through Advancing Innovative Neurotechnologies (BRAIN)





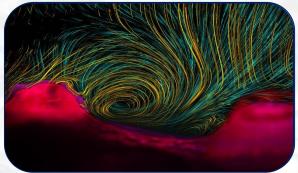


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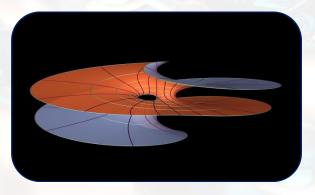




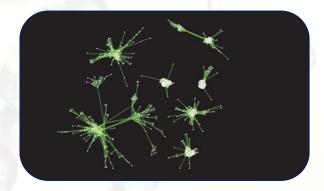
















### Geosciences (GEO)



## Lina Patino Division of Earth Sciences <a href="mailto:lpatino@nsf.gov">lpatino@nsf.gov</a>

- Manages the EAR education and human resources program.
- Participates in cross NSF initiatives, e.g. GRF, career life balance.
- Adjunct associate professor at Michigan State University.
- Twice served GEO as acting section head for the Surface Processes Section.





### Geosciences (GEO)

Dr. Roger Wakimoto, Assistant Director
Dr. Margaret Cavanaugh, Deputy Assistant Director

Division of Atmospheric and Geospace Sciences (AGS)

Paul Shepson, Division Director

**Division of Ocean Sciences (OCE)** 

**Deborah Bronk**, Division Director

**Division of Polar Programs (PLR)** 

Kelly Falkner, Division Director

**Division of Earth Sciences (EAR)** 

**Sonia Esperanca,** Acting Division Director **Carol Frost**, Division Director (As of Dec. 15)





### **Geosciences (GEO)**

### **Directorate Priorities**

Fundamental disciplinary and interdisciplinary research

• Support for research facilities and infrastructure (e.g.

research vessels, Antarctic facilities)

- Ocean Observatories Initiative
- Participation in IUSE
   (Improving Undergraduate
   STEM Education)
- SEES activities
   (e.g. Coastal, Water, Hazards)





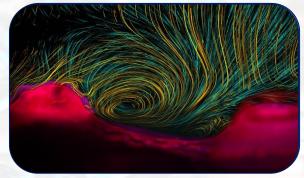


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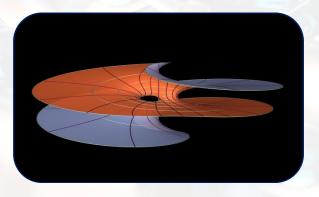




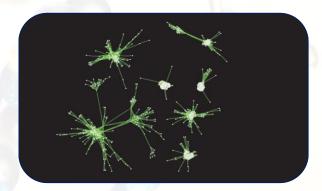
















### Mathematical & Physical Sciences (MPS)



#### **Bogdan Mihaila**

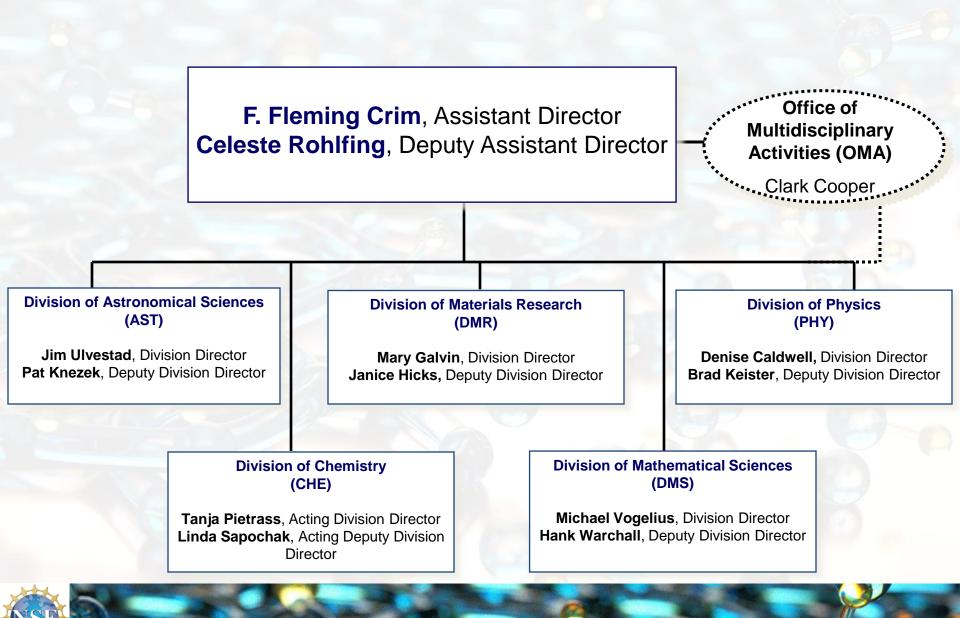
Physics Bmihaila@nsf.gov

- Directs the Theoretical Nuclear Physics and Computational Physics Programs.
- Worked on materials science and developed physics-based simulations for process modeling and engineering at Los Alamos National Laboratory.
- Postdoctoral fellow at two national labs:
   Oak Ridge and Argonne.
- Elected American Physical Society fellow.





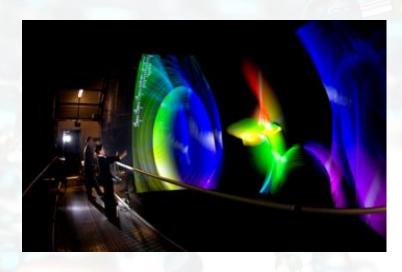
### Mathematical & Physical Sciences (MPS)



### Mathematical & Physical Sciences (MPS)

### **Priorities**

- Physical sciences at the nanoscale
- Science beyond "Moore's Law"
- Physics of the Universe
- Complex systems (multi-scale, emergent phenomena)
- Fundamental mathematical and statistical science
- Sustainability (energy, environment, climate)
- Interface between the physical and life sciences
- Computational and data-enabled science and engineering (CDS&E)





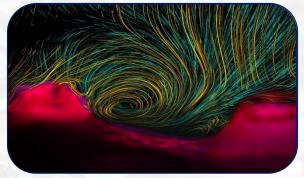


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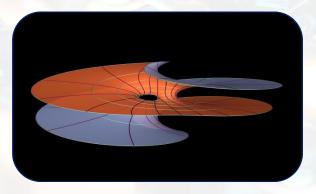




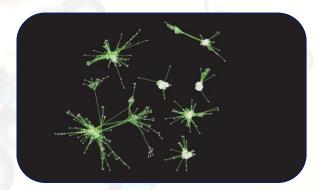
















### Social, Behavioral, & Economic Sciences (SBE)



#### **Bill Badecker**

Linguistics Program Director
Behavioral and Cognitive Sciences
wbadecke@nsf.gov

- Program Director for Linguistics
   Program
- SBE/BCS representative on the CAREER Coordinating Committee
- Professor from the University of Arizona Program in Cognitive Science





### Social, Behavioral & Economic Sciences



SBE Office of Multidisciplinary Activities (SMA)

Behavioral and Cognitive Sciences (BCS)

Mark Weiss, Division Director Amber Story, Deputy Division Director Social and Economic Sciences (SES)

**Jeryl Mumpower**, Division Director **Alan Tomkins**, Deputy Division Director

National Center for Science and Engineering Statistics (NCSES)

John Gawalt, Division Director Jeri Mulrow, Deputy Division Director





### **SBE Directorate**

### **Directorate Priorities**

- Cognitive Science/Neuroscience: Understanding the Brain
- Science of Learning
- Interdisciplinary Behavioral and Social Sciences (IBSS)
- Big Data for the SBE Sciences
- Science of Disparities: Developing and testing theories of the causes, contexts, and consequences of inequality
- Research Infrastructure, including the Big Three Surveys:
   American National Election Studies (ANES), General Social
   Survey (GSS), and Panel Study of Income Dynamics (PSID)
- Provide statistical data on the Science and Engineering enterprise in the US and abroad



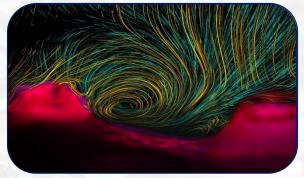


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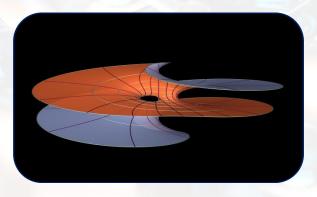




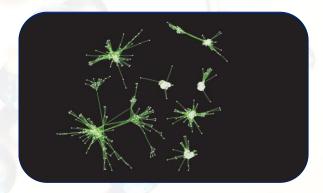


















### Randy L. Phelps

Integrative Activities <a href="mailto:rphelps@nsf.gov">rphelps@nsf.gov</a>

- Co-coordinaties two NSF-wide programs: MRI and STC.
- Recent co-chair and still active member, INSPIRE Working Group
- Former program director in NSF's Astronomy Division
- Former full professor in the Department of Astronomy and Physics at California State University, Sacramento.





Wanda E. Ward, Office Head (Vacant) Deputy Office Head

**Integrative Activities (IA)** 

Wanda E. Ward, Section Head

Experimental Program to Stimulate Competitive Research (EPSCoR)

Denise Barnes, Section Head

International Science and Engineering (ISE)

Kelsey Cook, Section Head (Acting)





### **Office Priorities**

- IA: Science and Technology Centers (STC)
- IA: Major Research Instrumentation (MRI)
- IA: Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE)
- EPSCoR: Research Infrastructure Improvement (RII)
  - RII Track-1: Statewide projects to build research competitiveness in areas aligned with state S&T plans.
  - RII Track-2 Focused EPSCoR Collaborations: inter-state collaborations on topics of regional and national importance.
  - RII Track-3 Building Diverse Communities: Pilot program to develop effective approaches to broadening participation of women, underrepresented minorities, people with disabilities or from rural communities in STEM.
- ISE: See ISE presentation to follow







### **Elizabeth (Libby) Lyons**

International Science & Engineering elyons@nsf.gov

- NSF program manager since 1996.
- Just returned from 3.5 years at the U.S.
   Department of State
- Past NSF program coordinator for PIRE and the Africa, Near East and South Asia region.
- Former program officer in NSF's Division of Environmental Biology.
- Biology faculty member for 10 years at Northwestern University and Amherst College



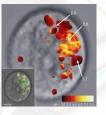


### **Office Priorities**

- Advance the FRONTIERS of Science and Engineering via international collaboration
- Prepare a GLOBALLY-ENGAGED U.S. S&E workforce
- <u>Develop</u> GLOBAL KNOWLEDGE NETWORKS that link U.S. faculty and students to the world
- Leverage RESOURCES, EXPERTISE, FACILITIES around the globe



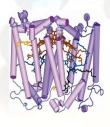










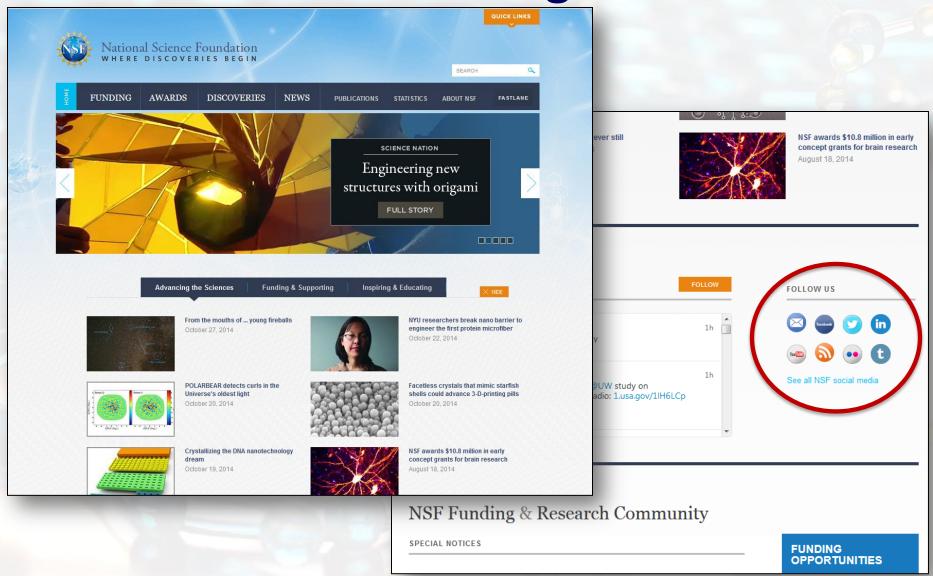






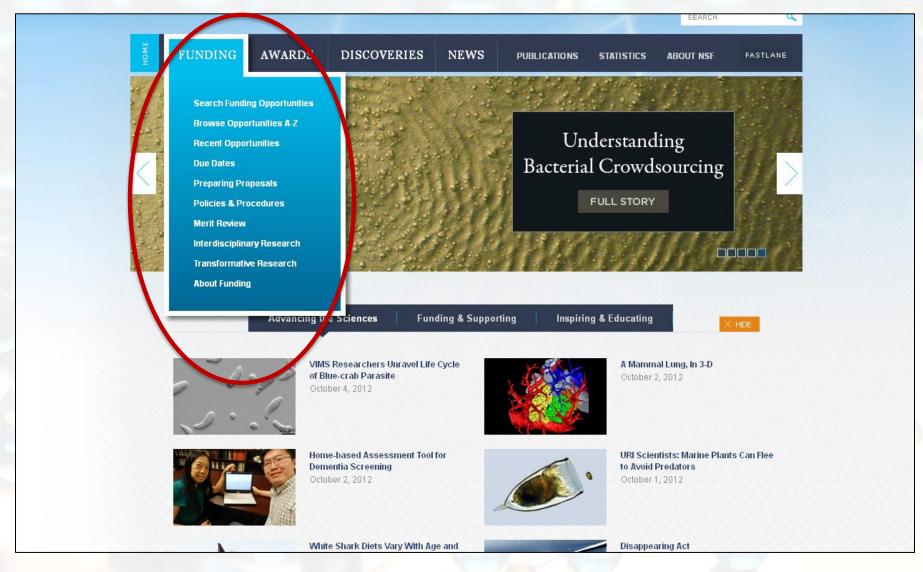


### www.NSF.gov





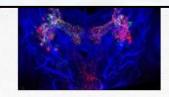








password security? June 2, 2014



features funding opportunities, research areas April 2, 2014

#### NSF Funding & Research Community

#### SPECIAL NOTICES

NSF Strategic Plan for FY 2014-2018

New NSF Proposal & Award Policies and Procedures Guide Issued, Effective for Proposals Submitted or Due On or After February 24, 2014

NSF Information Related to the American Recovery and Reinvestment Act of 2009

#### **EVENT CALENDAR**

17 JUN

NSF ADVANCE Program New Solicitation Webinars WEBCAST

19 JUN CDL - The Future of Computing - Mediated Research and Innovation WEBCAST

The Future of Computing Madiated Research and Innovation



Search Funding Opportunities

GO

▼ GO

Enter search term

Search by Program Area Select One

VIEW ALL FUNDING OPPORTUNITIES

Proposal and Award Policies and Procedures Guide

Prepare a Proposal

Upcoming Due Dates

Submit Proposal to FastLane







#### National Science Foundation

QUICK LINKS



#### Research Areas

- Biological Sciences
- Computer & Information Science & Engineering
- Cyberinfrastructure
- Education and Human Resources
- Engineering
- Environmental Research & Education
- Geosciences
- Integrative Activities
- International Science & Engineering
- Mathematical & Physical Sciences
- Polar Programs
- Social, Behavioral & Economic Sciences



#### Funding & Awards

#### **FUNDING INFO**

- Search Funding Opportunities
- Browse Funding Opportunities A-Z
- Recent Funding Opportunities
- How to Prepare a Funding Proposal
- Grant Proposal Guide
- Submit a Proposal to FastLane

#### **AWARD INFO**

- Managing Awards
- Award & Administration Guide
- Search Awards
- Award Statistics (Budget Internet Info System)



#### Contact Us

- Staff Directory
- Organization List
- Visit NSF
- Work at NSF
- Do Business with NSF
- Press
- Inspector General Hotline
- How Do I ...?

#### The National Science Foundation

4201 Wilson Boulevard, Arlington,

Virginia 22230, USA

Tel: (703) 292-5111 FIRS: (800) 877-8339

TDD: (800) 281-8749



#### **Learning Resources**

- Film, TV, Exhibits & More!
- Slideshows & Photo Galleries
- Classroom Resources
- Funding for Research on Learning in Formal & Informal Settings



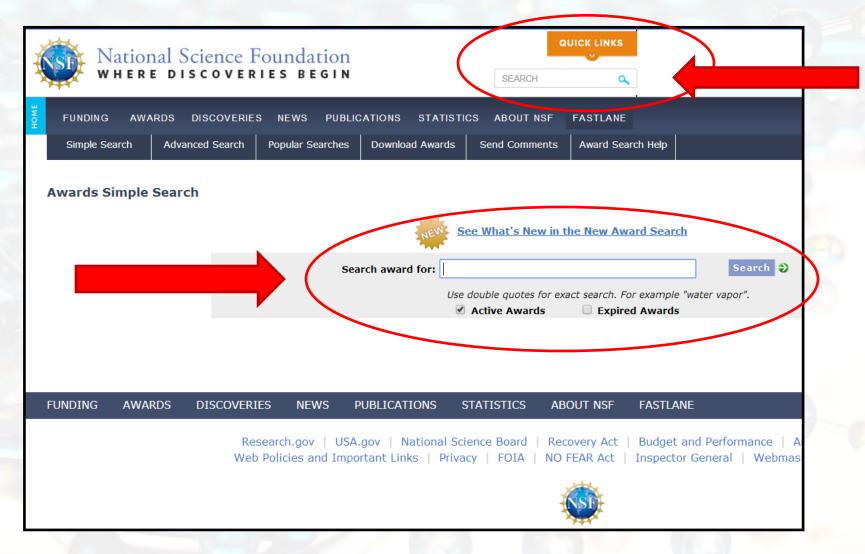
#### News & Discoveries

- Recent News
- Recent Discoveries
- Multimedia Gallery
- Special Reports



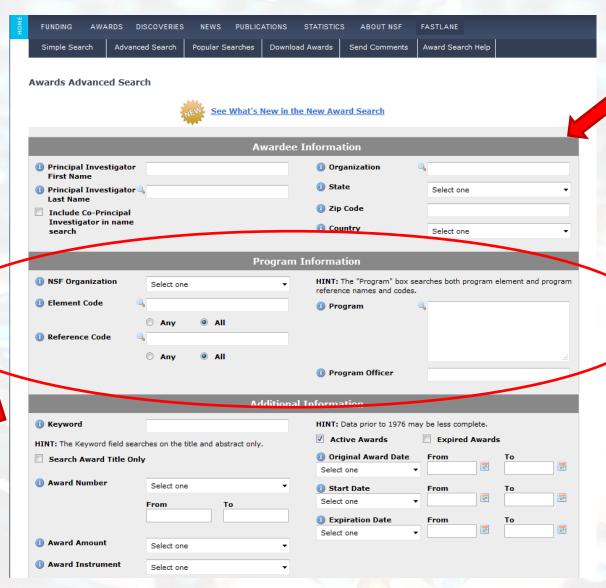


















Secure and Trustworthy Cyberspace (SaTC)

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### **Navigating a Program Website on** www.NSF.gov

Program officer list

Deadlines and announcements

Program description

Relevant links

Past funding

### **Drilling Down**

**Directorate for Computer & Information Science & Engineering** 

#### **Secure and Trustworthy Cyberspace (SaTC)**

#### CONTACTS

ı				
	Name	Email	Phone	Room
	Jeremy Epstein	jepstein@nsf.gov	(703) 292-8338	1175
	Nina Amla	namla@nsf.gov	(703) 292-8910	1115
	Christopher Clifton	cclifton@nsf.gov	(703) 292-8930	
	Sol Greenspan	sgreensp@nsf.gov	(703) 292-8910	1115
	Wenjing Lou	wlou@nsf.gov	(703) 292-8950	1175
	Anita Nikolich	anikolic@nsf.gov	(703) 292-8970	
	Deborah Shands	dshands@nsf.gov	(703) 292-4505	1175
	Ralph Wachter	rwachter@nsf.gov	(703) 292-8950	1175
	Victor P. Piotrowski	vpiotrow@nsf.gov	(703) 292-5141	865
	Andrew D. Pollington	adpollin@nsf.gov	(703) 292-4878	1025
	Zhi (Gerry) Tian	ztian@nsf.gov	(703) 292-2210	525
	Heng Xu	hxu@nsf.gov	(703) 292-8643	995 N

SaTC Questions: satc@nsf.gov

**PROGRAM GUIDELINES** 

Solicitation 14-599

List of program officers and contact info (ask if email or phone is better)

Do NOT send to each person!

Generic address

Link to current solicitation(s)

65



### **Drilling Down**

#### **Important Information for Proposers**

A revised version of the NSF Proposal & Award Policies & Procedures Guide (PAPPG) (NSF 15-1), is effective for proposals submitted, or due, on or after December 26, 2014. The PAPPG is consistent with, and, implements the new Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (Uniform Guidance) (2 CFR § 200). NSF anticipates release of the PAPPG in the Fall of 2014. Please be advised that, depending on the specified due date, the guidelines contained in NSF 15-1 may apply to proposals submitted in response to this funding opportunity.

#### **DUE DATES**

Full Proposal Window: December 4, 2014 - December 19, 2014

CYBERSECURITY EDUCATION Projects

December 4 - December 19, Annually Thereafter

Full Proposal Window: January 2, 2015 - January 14, 2015

SMALL Projects

January 2 - January 14, Annually Thereafter

Full Proposal Window: September 2, 2015 - September 21, 2015

MEDIUM Projects

September 2 - September 19, Annually Thereafter

Full Proposal Window: November 4, 2015 - November 19, 2015

LARGE Projects

November 4 - November 19, Annually Thereafter

#### SYNOPSIS

Cyberspace has transformed the daily lives of people for the better. The rush to adopt cyberspace, however, has exposed its fragility and vulnerabilities: corporations, agencies, national infrastructure and individuals have been victims of cyber-attacks. In December 2011, the National Science and Technology Council (NSTC) with the cooperation of NSF issued a broad, coordinated Federal strategic plan for cybersecurity research and development to "change the game," minimize the misuses of cyber technology, bolster education and training in cybersecurity, establish a science of cybersecurity, and transition promising cybersecurity research into practice. This challenge requires a dedicated approach to research, development, and education that leverages the disciplines of mathematics and statistics, the social sciences, and engineering together with the computing, communications and information sciences.

General announcements

Submission windows and/or deadlines

Program description



### **Drilling Down**

#### **RELATED URLS**

Frequently Asked Questions (FAQs) for SaTC (NSF 14-599)

Frequently Asked Questions (FAQs) for SaTC (NSF 13-578) - archived

Frequently Asked Questions (FAQs) for SaTC (NSF 12-503) - archived

SaTC Webinar (December 2, 2011)

#### **REVISIONS AND UPDATES**

#### THIS PROGRAM IS PART OF

Additional Funding Opportunities for the CCF Community

Additional Funding Opportunities for the CNS Community

Additional Funding Opportunities for the IIS Community

Additional Opportunities

Other Special Research Programs Available to DMS Communities

What Has Been Funded (Recent Awards Made Through This Program, with Abstracts)

Map of Recent Awards Made Through This Program

News

**Discoveries** 

Related URLs (FAQs, webinars, etc)

Other related organizations

Past funding by the program



### **Additional Information on Resources**

### Join Directorate Specific Listserves!

### Use Grants.gov's search feature







### **Questions on Funding Opportunities?**



Contact your NSF Program Officer (after checking the website and solicitation ©)

Work with your organization's sponsored projects office

Look for workshops on federal research funding







# Things to Consider Before Applying...





### **Five Key Elements**

- 1. Great idea
- 2. Fit with current research expertise and career development plans
- 3. Ability to devise a strategy including benchmarks, timelines, and metrics
- 4. Adequate resources to accomplish your project
- 5. Assessment Plan



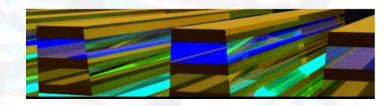


### **Getting Started**

### Carefully study the Grant Proposal Guide (GPG)

### Also study:

- Categories of Funding Opportunities
- Dear Colleague Letters
- Program Descriptions
- Program Announcements
- Program Solicitations









## **Developing your Proposal**

## **Key Questions for Prospective Investigators**

- What has already been done?
- What do you intend to do?
- Why is the work important?
- How is the work unique or cutting edge?
- How are you going to do the work?
- Do you have the right team?





## **Proposal Development Strategies:**

## What Do You Need (Besides \$)?

- Prepare to do the project
  - Realistically assess needs
  - Determine available resources
  - Develop preliminary data
  - Present to colleagues/mentors/students
- Determine possible funding sources (NSF may not be the right or the only one)







## **Proposal Development Strategies:**

What details should you glean from the solicitation?



- Overall scope and mission
- Instructions (deviations from the GPG)
- How your proposed project fits with the solicitation
- Review procedures and criteria
- Deadlines





## **Proposal Development Strategies:**

## Who Should You Talk To? How Should You Contact Them?

### **NSF Program Officer**

- ➤ Your proposed project
- Clarifications on specific program requirements/limitations
- Current program patterns

### Your organization's sponsored projects office

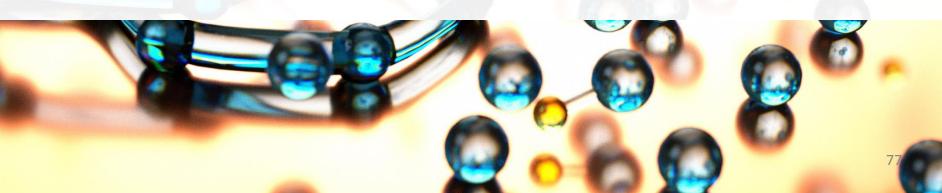
- University guidelines for applications
- Institutional Review Board "IRB" Approvals (IACUC approvals, etc.)

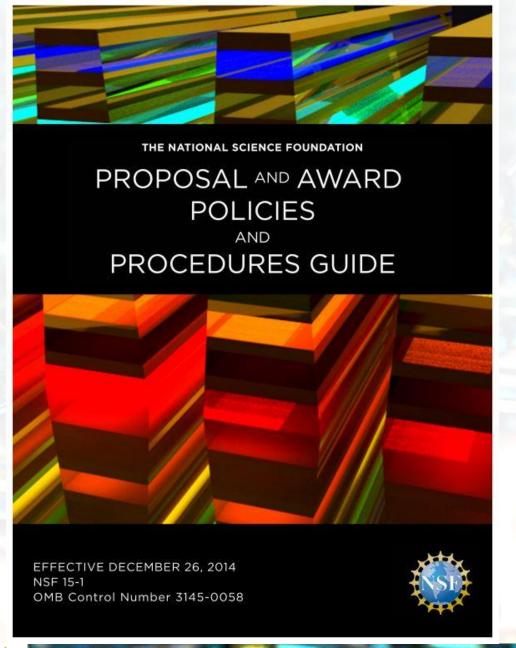






# So You Want to Write a Proposal...





The Grant Proposal Guide (GPG) is contained within the PAPPG

Revised NSF15-1, December 26, 2014





## Where Are Funding Opportunities?

Two main types of opportunities: Solicited Proposals

**Unsolicited Proposals** 

**Program Descriptions** 

**Program Announcements** 

**Program Solicitations** 

Dear Colleague Letters (DCL)





## What to Look for in a Program Announcement or Solicitation

- Goals
- Eligibility Requirements



Review Criteria







## Sample Cover Page of a Solicitation

#### Louis Stokes Alliances for Minority Participation (LSAMP)

PROGRAM SOLICITATION

NSF 12-564



REPLACES DOCUMENT(S): NSF 11-543



#### National Science Foundation

Directorate for Education & Human Resources Division of Human Resource Development



Full Proposal Deadline(s) (due by 5 p.m. proposer's local time):

August 28, 2012

Bridge to the Doctorate

October 05, 2012

First Friday in October, Annually Thereafter

Bridge to the Doctorate

Program
Solicitation
Number

NSF Directorates and Offices providing funding for this opportunity





## Sample Cover Page of a Solicitation

#### Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant or Cooperative Agreement

Estimated Number of Awards: 60



Up to 60 awards will be made across fiscal 2012 and 2013.

In FY 2012, up to 20 Bridge to the Doctorate (BD) grants will be made.

In FY2013, 20 Alliance grants (this includes 5 B2B), up to 15 Bridge to the Doctorate (BD) grants and up to 5 Broadening Participation Research (BPR) in STEM Education grants.

Anticipated Funding Amount: \$20,000,000



\$20,000,000 across fiscal years 2012 and 2013; Subject to the availability of funds.

Expected number of awards funded by the program per year

Expected funds available to the program per year





## Sample Cover Page of a Solicitation

#### **Eligibility Information**

#### Organization Limit:

Proposals may only be submitted by the following:

 Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.

#### PI Limit:

Alliance (including the B2B) and BD: To promote institutional commitments to increase the quality and quantity of under-represented minorities in STEM disciplines, the President or Provost of the lead institution should serve as the Principal Investigator. A full explanation should be provided for a PI designation in variance with this requirement. Co-principal investigators from partner institutions may be designated, as appropriate, for the project.

Broadening Participation Research in STEM Education: Eligible PI/co-PI(s) for proposals applying for educational research or evaluation support should be the individual conducting or responsible for the research or evaluation project. Other potential co-Principal Investigators include collaborators on the research project. At least one of the PI's must have experience in educational research.

#### Limit on Number of Proposals per Organization:

Alliances (including B2B) and BD: 1

Broadening Participation Research in STEM Education: No limit.

Limit on Number of Proposals per PI:

Alliances (including B2B): 1

Bridge to the Doctorate: 1

Broadening Participation Research in STEM Education: No limit



Eligibility information for institutions/PIs submitting proposals





## **Proposal Due Dates**

#### No Deadlines -

Proposals may be submitted at any time

### Target Dates –

Dates after which proposals will still be accepted, but they may miss a panel. Alert the Program Office if you think you might miss the date

**Deadline Dates** – Proposals will not be accepted after this date and time (5 p.m. submitter's local time)

#### **Submission Windows –**

Designated periods of time during which proposals are accepted. Closing date converts to a deadline date







## **Types of Submissions**

#### Letter of Intent -

Facilitates management of reviewers and panelists

#### **Preliminary Proposal-**

Sometimes required, sometimes optional

#### **Full Proposal-**

Must conform to GPG requirements (Except when they are superseded

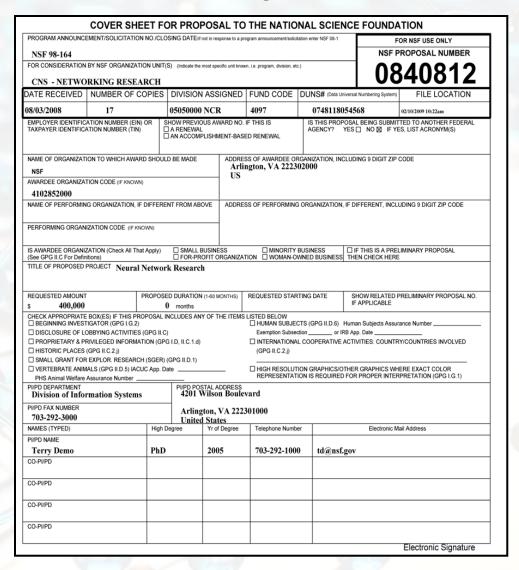
by the requirements of the solicitation)





#### **Cover Sheet**

Many of the boxes on the cover sheet are electronically prefilled as part of the FastLane login process.







#### **Project Summary**

Text boxes must contain an Overview, a Statement on Intellectual Merit, and a Statement of Broader Impacts.

Proposals that do not separately address the Overview and both merit review criteria in their respective text boxes will not be accepted by FastLane.

Project summaries with special characters (e.g., mathematical formulas) may be uploaded as a PDF document.

#### **Project Description**

Proposers should address what they want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful.

A separate section within the narrative labeled "Broader Impacts of the Proposal Work" must be completed.





#### **References Cited**

Proposers must follow accepted scholarly practices in providing citations for source materials.

#### **Biographical Sketches**

For all senior project personnel. These must not exceed two pages in length per individual, and abide by a very specific format.

#### **Budget**

Each proposal must contain a budget for each year of support requested. The budget justification for the proposing organization must be no more than three pages for all years of the project combined. Each subaward may include a separate budget justification of no more than three pages.





## **Budgetary Guidelines**

#### Amounts should be:

- Realistic and reasonable
- Well-justified and should establish need
- **Consistent with** program guidelines in the solicitation, GPG, and in the Award and **Administration Guide** (AAG)

#### **Eligible costs consist of:**

- Personnel
- Equipment
- Travel
- **Participant support**
- Other direct costs (e.g., subawards, consultant services, computer services, and publications costs)
- **Indirect costs** (As appropriate)





## **NSF Cost Sharing Policy**

- Inclusion of voluntary committed cost sharing is <u>prohibited</u> in the budget of solicited & unsolicited proposals.
- Organizations may, at their own discretion, continue to contribute voluntary uncommitted cost sharing to NSF-sponsored projects as part of the section for Facilities, Equipment, and Other Resources.





#### Facilities, Equipment, and Other Resources

Used to assess the adequacy of the organizational resources available to perform the effort proposed. Should not contain quantifiable financial information.

#### **Current and Pending Support**

This section of the proposal requires reporting on all current and pending support for ongoing projects and proposals from any funding source.







## **Special Information and Supplementary Documentation**

- Letters of support versus letters of commitment
- **Postdoctoral mentoring plans**
- **Data management plans**
- You should alert NSF officials to unusual circumstances that require special handling (i.e. proprietary information)
- Solicitations may specify what is and is not allowed to be submitted





## **Mentoring for Postdoctoral Researchers**

- Explicit description of the mentoring activities
- Must include a mentoring plan as a supplementary document (maximum one-page)
- For collaborative proposals, lead organization must submit a single mentoring plan for all postdoctoral researchers supported under the entire project.







## **Data Management Plan Requirements**

Requirements by Directorate, Office, Division, Program, or other NSF Unit

Links to data management requirements and plans relevant to specific Directorates, Offices, Divisions, Programs, or other NSF units, are provided below. If guidance specific to the program is not provided, then the requirements established in <a href="Grant Proposal Guide">Grant Proposal Guide</a>, Chapter II.C.2.i apply.

Please note that if a specific program solicitation provides guidance on preparation of data management plans, such guidance must be followed.

- Engineering Directorate (ENG)
  - Directorate-wide Guidance
- · Geological Sciences Directorate (GEO)
  - Division of Earth Sciences
  - Integrated Ocean Drilling Program
  - Division of Ocean Sciences
- Mathematical and Physical Sciences Directorate (MPS)
  - Division of Astronomical Sciences
  - Division of Chemistry
  - Division of Materials Research
  - Division of Mathematical Sciences
  - Division of Physics
- Social, Behavioral and Economic Sciences Directorate (SBE)
  - Directorate-wide Guidance

<u>Data Management & Sharing Frequently Asked Questions (FAQs)</u> - updated November 30, 2010

Requirements may vary by Directorate or Office

nsf.gov/bfa/dias/policy/dmp.jsp





## Questions?









## What Is a Crosscutting Program?

NSF has many programs that are sponsored by more than one NSF unit.... cutting across the Foundation in different ways.

....NSF also participates in many programs with other U.S. government agencies.







## **Types of Crosscutting Activities**

- International
- Interdisciplinary research theme-based (e.g., Designing Materials, Hazards and Disasters)
- People-oriented (e.g., ADVANCE, CAREER, REU, Work-Life Balance)
- Infrastructure (e.g., MRI)
- Translational (ICorps, SBIR)
- Institutional, Centers (e.g., IUCRC, STC)





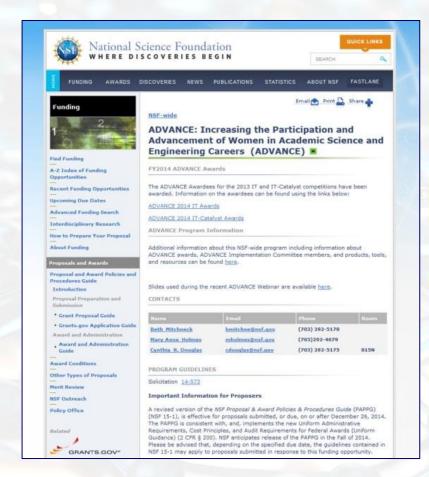
## **Find Funding for Crosscutting Programs**

Go to <a href="mailto:nsf.gov/funding/pgm\_list.jsp?type=xcut">nsf.gov/funding/pgm\_list.jsp?type=xcut</a>





## ADVANCE: Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers



### **Goals:**

- Systemic approaches to increase the representation and advancement of women in academic STEM careers.
- Contribute to and inform the general knowledge base on gender equity in the academic STEM disciplines.





## **Faculty Early Career Development (CAREER)**

### **Goal:**

 Provide stable support at a sufficient level and duration to enable awardees to develop careers as outstanding researchers and educators who effectively integrate teaching, learning, and discovery













## Graduate Research Fellowship Program (GRFP)



### Goals:

- Select, recognize, and financially support individuals with the demonstrated potential to be high achieving scientists and engineers, <u>early in their careers</u>.
- Broaden participation in science and engineering of underrepresented groups, including women, minorities, persons with disabilities, and veterans

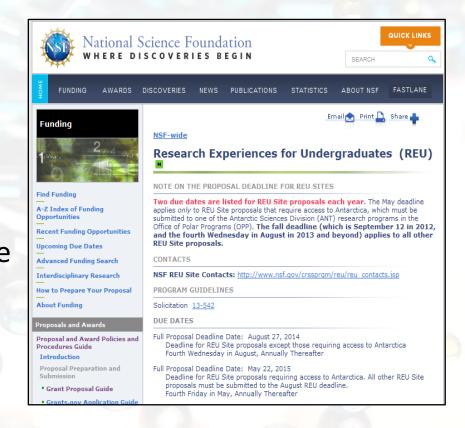




## Research Experiences for Undergraduates (REU)

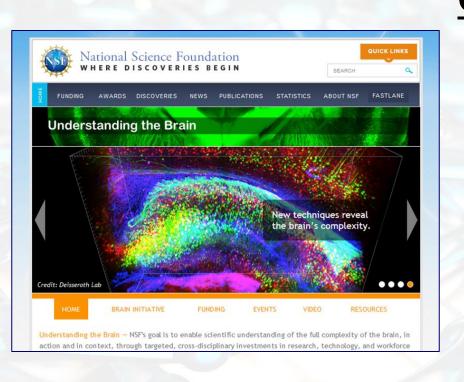
### **Goals:**

- Initiate and conduct projects that engage a number of undergraduate students in research.
- Involve students in research
   who might not otherwise have
   the opportunity, particularly
   those from academic
   institutions where research
   programs are limited.





## Brain Research through Advancing Innovative Neurotechnologies (BRAIN)



### Goal

 Enable scientific understanding of the full complexity of the brain in action and in context through targeted, crossdisciplinary investments in research, technology, and workforce development

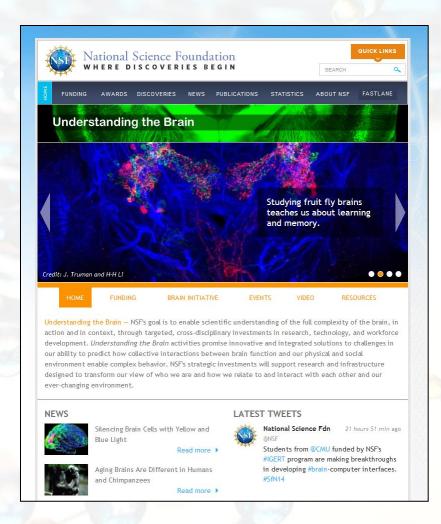




## Brain Research through Advancing Innovative Neurotechnologies (BRAIN)

### **Thematic areas of BRAIN:**

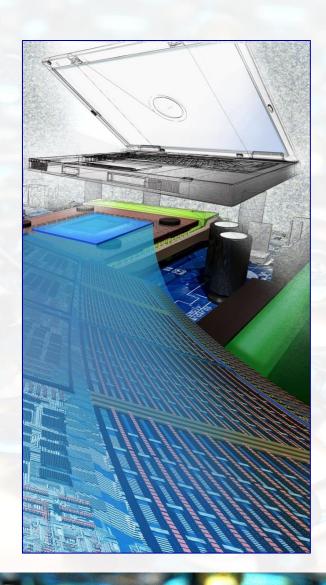
- Multi-scale Integration of the Dynamic Activity and Structure of the Brain
- Neurotechnology and Research Infrastructure
- Quantitive Theory and Modeling of Brain Function
- Brain-Inspired Concepts and Designs
- BRAIN Workforce Development







## **Data Science**



## Goal

 Improve the nation's capacity in data science by investing in the development of human capital and infrastructure





## Major Research Instrumentation (MRI) Goals:



- Support acquisition of major state-ofthe-art instrumentation
- Foster development of the next generation of major instrumentation
- Integrate research with education
- Use, advance, and/or expand the Nation's cyber-infrastructure and/or high performance computing capability
- Promote academic and private sector instrument development partnerships



# **NSF Innovation Corps (I-CORPS)**



- Public-private partnership program teaches grantees to identify valuable product opportunities that can emerge from academic research, and offers entrepreneurship training to student participants.
- Three main parts of I-Corps:
  - <u>I-Corps Teams</u>-- composed of academic researchers, student entrepreneurs and business mentors who participate in the <u>I-</u> Corps curriculum.
  - <u>I-Corps Nodes--</u>Online curricula and on-site activities
  - <u>I-Corps Sites</u> catalyze additional groups to explore potential I-Corps Team projects and other entrepreneurial opportunities that build on basic research.





# Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR)



- Provides non-dilutive funds for early-stage R&D at small businesses and startups.
- Hard science and engineering technology projects with high technical risk and potential for significant commercial or societal impact.

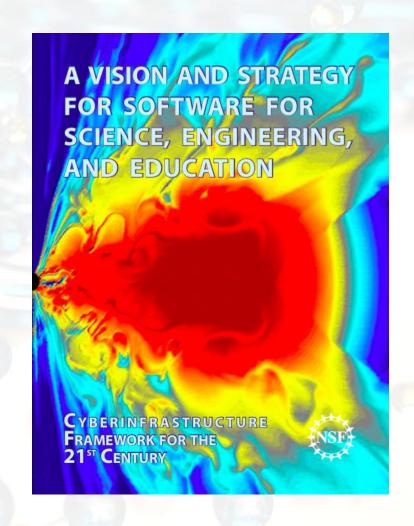




# Cyber Infrastructure for the 21st Century (CIF21)

CIF21 advances new computational infrastructure as a priority for driving innovation in science and engineering

- $-Sl^2$
- DIBBs
- CDS&E





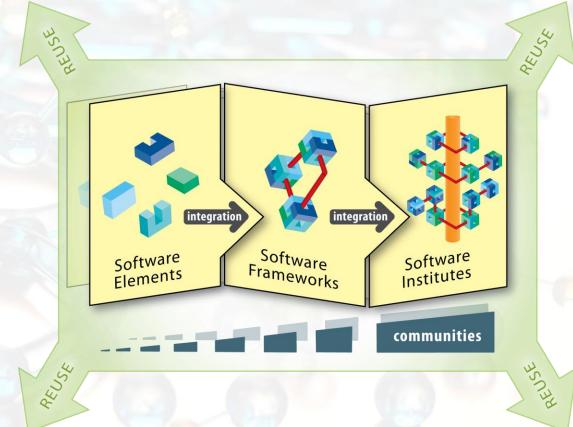
# Software Infrastructure for Sustained Innovation (SI<sup>2</sup>)

Because software is the integral enabler of computation, experiment and theory, and a key part of the cyberinfrastructure that enables S&E research to achieve

new discoveries,

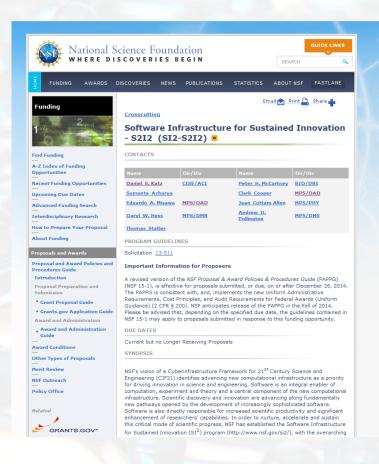
SI<sup>2</sup> encourages PIs to develop software with:

- purpose
- a wide audience
- a fit with other infrastructure
- reusability





# Software Infrastructure for Sustained Innovation (SI<sup>2</sup>)



#### **Goals:**

- Transform innovations in research and education into sustained software resources that are an integral part of the cyberinfrastructure
- Create a software ecosystem
   that includes all levels of the
   software stack and scales from
   individual or small groups of
   software innovators to large
   hubs of software excellence





## **International - A Crosscutting Portfolio**

#### International activities at NSF

- Span all NSF Directorates and Offices
- Globalize NSF research and education
- Strengthen partnerships with foreign counterpart funders
- Involve cooperation with other U.S. government agencies, private foundations







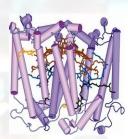
#### **Examples of Support for International Research**

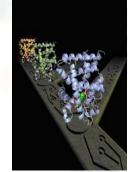
- Partnerships for International Research and Education (PIRE)
- Science Across Virtual Institutes (SAVI)
- Partnerships for Enhanced Engagement in Research (PEER) – with USAID
- International Research Experiences for Students (IRES)
- Graduate Research Opportunities Worldwide (GROW)
- East Asia Pacific Summer Institutes (EAPSI)
- (International) Postdoctoral Research Fellowship Program

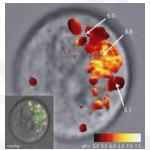




















# Video



NSF-Merit-Review-Process\_Video.mp4





## **NSF's Proposal & Award Process Timeline**







# When Preparing Proposals

- Read the funding opportunity; ask a Program Officer for clarifications if needed
- Address all the proposal review criteria
- Understand the NSF merit review process
- Avoid omissions and mistakes
- Check your proposal to verify that it is complete!

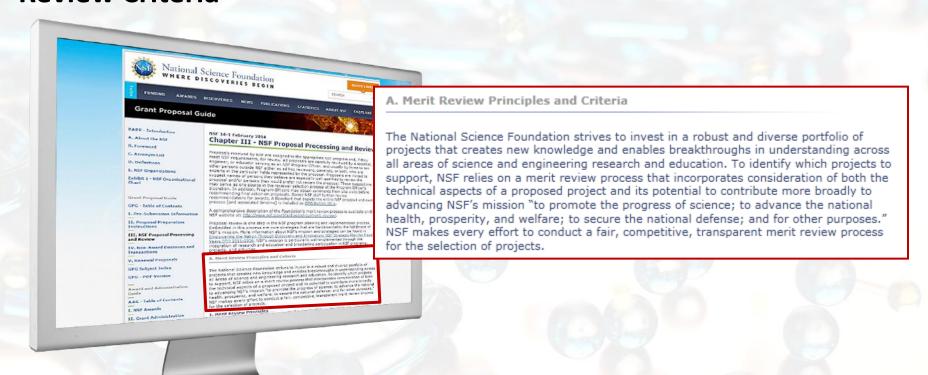
Double Check that the proposal NSF receives is the one you intended to send





## Merit Review Guiding Principles & Criteria

The Grant Proposal Guide (GPG) contains a description of the Merit Review Criteria





#### **Review Format in FastLane**

- Reviewers provide feedback to NSF based on the Review Criteria and the **Review Elements**
- Review Criteria and Elements are available as reviewers provide feedback

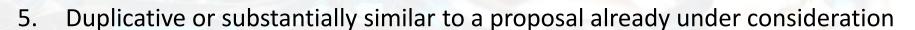
The following elements should be considered in the review for both criteria:
What is the potential for the proposed activity to     a advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and     benefit society or advance desired societal outcomes (Broader Impacts)?     To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?  3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
How well qualified is the individual, team, or institution to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home institution or through collaborations) to carry out the proposed activities?
In the context of the five review elements, please evaluate the strengths and weaknesses of the proposal with respect to intellectual merit.
In the context of the five review elements, please evaluate the strengths and weaknesses of
the proposal with respect to broader impacts.
T
Please evaluate the strengths and weaknesses of the proposal with respect to any additional solicitation-specific review criteria, if applicable.
This are the strengths and weaknesses of the proposal with respect to
1





# 9 Reasons for Proposals to be Returned Without Review (RWR)

- 1. Does not meet NSF proposal preparation requirements
- 2. It is inappropriate for NSF funding
- 3. Insufficient lead time
- 4. Received a "Not invited" response to the submission after a preliminary proposal



- 6. Not responsive to the GPG or program announcement/solicitation
- 7. Does not meet an announced proposal deadline date and time
- 8. Proposal was previously reviewed and declined and has not been substantially revised
- 9. Duplicates another proposal that was already awarded



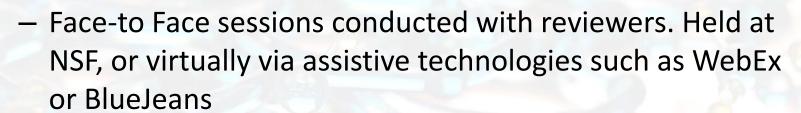




## **Types of Reviews**

- Ad Hoc
  - Proposals are sent out for review





- Combination
  - Some proposals may undergo supplemental ad hoc reviews before or after a panel review
- Internal
  - Reviewed by NSF Program Officers





#### **How are Reviewers Selected?**

- Three or more external reviewers per proposal are selected
- Types of Reviewers Recruited
  - Specific content expertise
  - General science or education expertise

#### Sources of Reviewers

- Former reviewers
- Program Officer's knowledge of the research area
- References listed in proposal
- Recent professional society programs
- S&E journal articles related to the proposal
- Reviewer recommendations included in proposal







#### What is the Role of the Reviewer?

- Review all proposal material and consider
  - The two NSF merit review criteria and any program specific criteria.
  - Adequacy of the proposed project plan- including the budget, resources, and timeline.
  - Priorities of the scientific field and of the NSF program
  - Potential risks and benefits of the project
- Make independent written comments on the quality of the proposal content.





#### What is the Role of the Review Panel?

Discuss the merits of the proposal with the other panelists

- Write a summary based on that discussion
- Provide some indication of the relative merits of different proposals considered







# Why Serve on an NSF Panel?

- Gain first-hand knowledge of the merit review process
- Learn about common problems with proposals



- Discover proposal writing strategies
- Meet colleagues and NSF Program
   Officers managing the programs
   related to your research





#### How Do I Become a Reviewer?

#### Contact the NSF Program Officer(s) of the program(s) that fit your expertise

- Introduce yourself as a strong potential reviewer based on your research experience
- Offer to send a 2-page CV with current contact information
- Stay in touch if you don't hear back right away







# **Conflicts of Interest (COI)**

What is a COI?

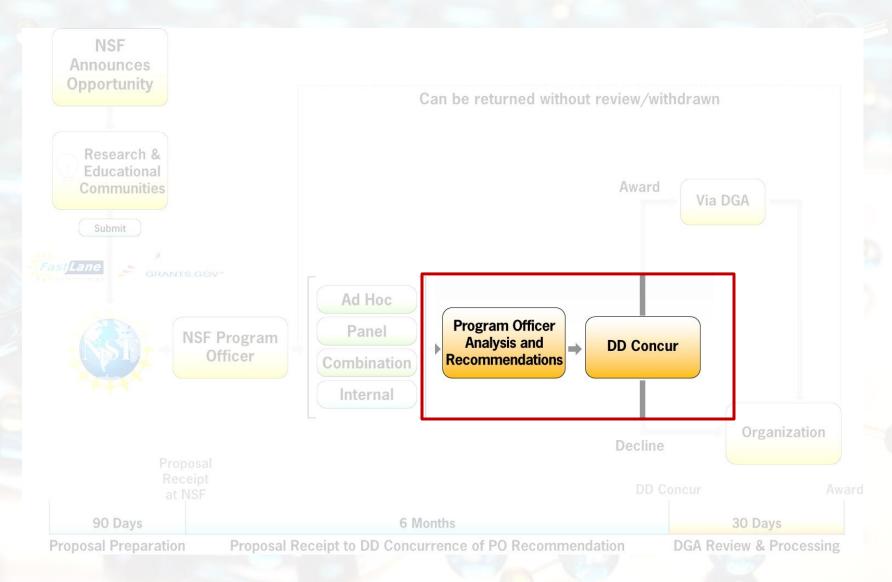
#### How we address conflict of interest

- NSF checks and avoids COIs in the review process
  - Institutional COIs
  - Personal COIs





# **Proposal Review and Processing**







# Funding Decisions Reviews are Advisory to NSF

- The merit review process provides:
  - Review of the proposal and a recommendation on funding.
  - Feedback (strengths and weaknesses) to the proposers.
- NSF Program Officers make funding recommendations guided by program goals and portfolio considerations.
- NSF Division Directors either concur or reject the Program Officers' funding recommendations.





#### **Feedback from Merit Review**

- Reviewer ratings (such as: E, V, G, F, P)
- Analysis of how well proposal addresses both review criteria: Intellectual Merit and Broader Impacts
- Proposal strengths and weaknesses
- Reasons for decline (if applicable)
- If you have any questions, contact the cognizant Program Officer.







#### **Documentation from Merit Review**

 Verbatim copies of individual reviews, excluding reviewer identities

- Panel summary or summaries (if panel review was used)
- Context statement (usually)
- Program Officer to Principal Investigator comments (formal or informal, written, email or verbal) as necessary to explain a decision





## **Examples of Reasons for Declines**

- Not considered competitive based on merit review criteria and program office concurrence
- Flaws or issues identified by the Program Officer

Funds were not adequate to fund all competitive proposals





#### **Revisions and Resubmissions**

- Do the reviewers and the NSF Program Officer identify significant strengths in your proposal?
- Can you address the identified weaknesses?
- Can the proposal be significantly revised?
- Are there other ways your colleagues or you think a resubmission can be strengthened?





**Contact your cognizant Program Officer!** 





# Possible Considerations for Funding a Competitive Proposal

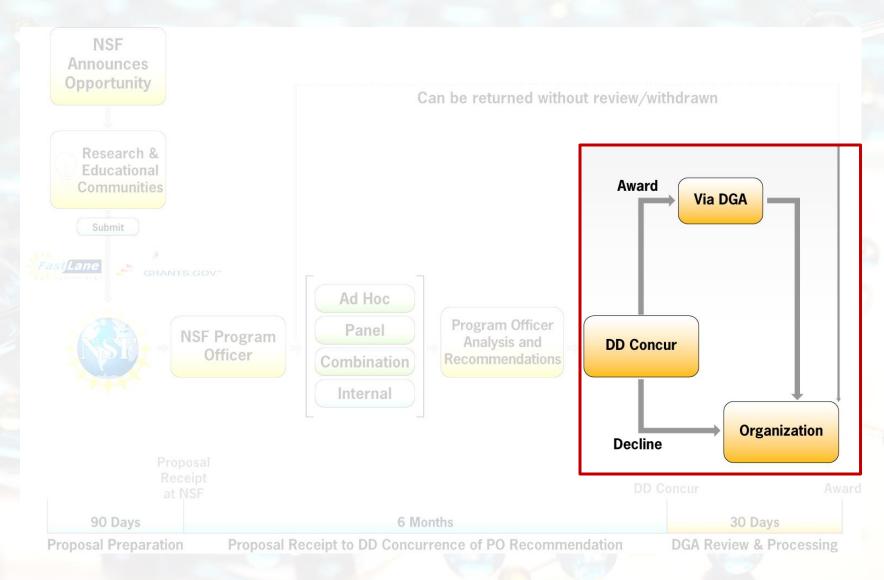
- Addresses all review criteria
- Likely high impact
- Broadening participation
- Educational impact
- Impact on institution/state

- Special programmatic considerations (e.g. CAREER/RUI/EPSCoR)
- Other support for PI
- "Launching" versus"Maintaining"
- Portfolio balance





# **Proposal Review and Processing**

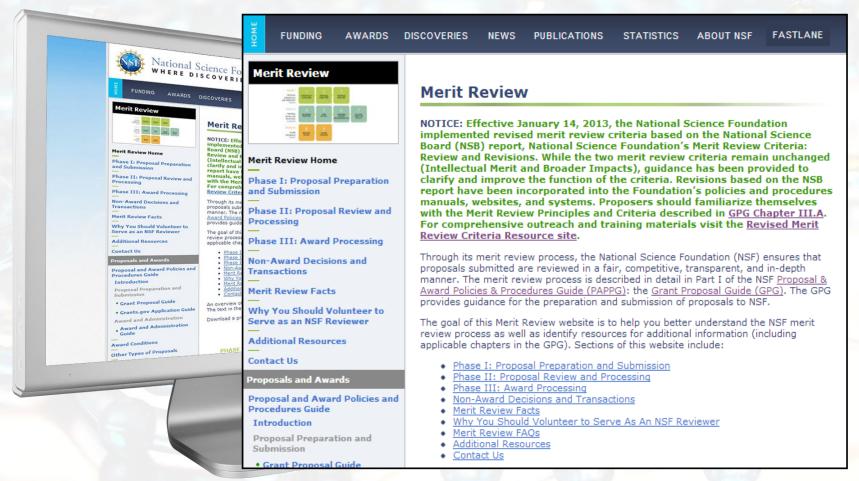






#### For More Information

#### Go to NSF's Home Page (<a href="http://www.nsf.gov">http://www.nsf.gov</a>)







# Ask Early, Ask Often!

Contact the cognizant Program Officer

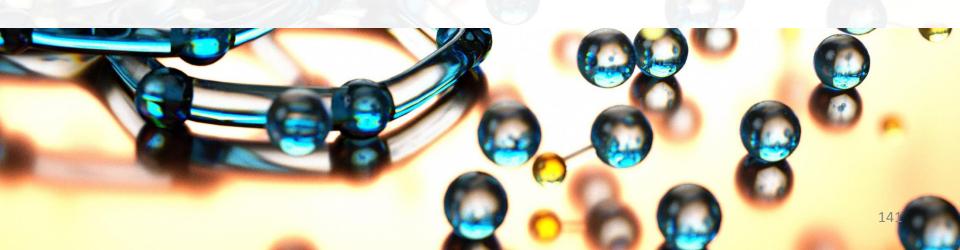








# 10 Ways to Write a Proposal That Won't Get Funded



#### Number 10



Assume the program guidelines have not changed, or simply, ignore them.







### Number 10

Carefully review and adhere to the guidelines. They matter a lot.

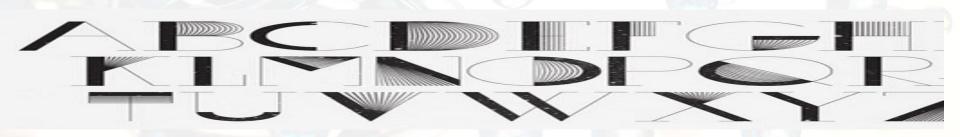






#### Number 9

Ignore details and make assumptions like page limits and font size restrictions are suggestions, not requirements.







Details matter! Proposals that ignore page limits and font sizes will be returned without review (without passing GO!)







Provide a template letter of commitment for your supporters to use







# Check with your Cognizant Program Officer

Many programs prohibit letters of any sort (as this may constitute a conflict of interest)

Individual and sincere letters of commitment stating why they support your project are valuable only in limited circumstances





Embellish. Inflate/reduce the budget for better standing in negotiations.







Ask for and justify the budget you need to accomplish the research.







Rest on your laurels. Assume your past accomplishments are well known and sufficient to carry the new proposal





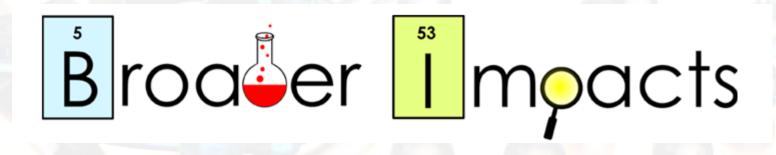
Provide context and detail results from prior funding – share quantitative data and impact.







Ignore or short change the broader impacts criteria.









Address BOTH intellectual merit AND broader impacts **thoroughly** and **explicitly** in their respective separate sections!





Use vagaries to describe evaluation such as

"Evaluation will be ongoing and consist of a variety of methods"







Imprecise evaluation will not cut it. Outline your oversight plan.







Facts, objective examples, and evidence speak to reviewers.







Don't check your speeling, nor you're grammer.







Professionalism and polish in the proposal shed a positive light on a researcher's professionalism and attention to detail in the



Download the proposal to make sure it is OK!







Wait until five minutes before the deadline to submit your proposal.







#### Adherence to deadlines is essential.

In order to ensure that you meet them, submit your proposal well in advance so that you can download the submitted document and check for problems.

Contact your Program Officer for extensions due to Federal holidays or emergencies.









